

Improving Efficiency and Reducing Administrative Burden through Electronic Communication

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Abstract

Background: The InBox messaging system is an internal, electronic program used at Mayo Clinic, Rochester, MN, to facilitate the sending, receiving, and answering of patient-specific messages and alerts. A *standardized* InBox was implemented in the Division of General Internal Medicine to decrease the time physicians, physician assistants, and nurse practitioners (clinicians) spend on administrative tasks and to increase efficiency.

Methods: Clinicians completed surveys and a preintervention InBox pilot test to determine inefficiencies related to administrative burdens and defects (message entry errors). Results were analyzed using Pareto diagrams, value stream mapping, and root cause analysis to prioritize administrative-burden inefficiencies to develop a new, standardized InBox. Clinicians and allied health staff were the target of this intervention and received standardized InBox training followed by a postintervention pilot test for clinicians.

Results: Sixteen of 28 individuals (57%) completed the preintervention survey. Twenty-eight clinicians participated in 2 separate 8-day pilot tests (before and after intervention) for the standardized InBox. The number of InBox defects was substantially reduced from 37 (Pilot 1) to 7 (Pilot 2). Frequent InBox defects decreased from 25% to 10%. More than half of clinicians believed the standardized InBox positively affected their work, and 100% of clinicians reported no negative affect on their work.

Conclusions: This project demonstrated the successful implementation of the standardized InBox messaging system. Initial assessments show substantial reduction of InBox entry defects and administrative tasks completed by clinicians. The findings of this project suggest increased clinician and allied health staff efficiency, satisfaction, improved clinician work-life balance, and decreased clinician burden caused by administrative tasks.

Introduction

The development of the electronic medical record (EMR) and other electronic communication systems gave hope to health care administrators and physicians, physician assistants, and nurse practitioners (clinicians) worldwide that with its implementation, clinician documentation time would decrease and, in turn, increase efficiency and improve delivery of quality care.¹⁻³ Recent research, however, describes workflow inefficiencies, reduced satisfaction,^{4,5} and clinician concerns⁶ in relation to using electronic communication systems.⁷

Mayo Clinic believes in providing quality, patient-centered care and creating a

health care workforce of the future to align with its core values. A strategic meeting was held by leadership of the Division of General Internal Medicine at which concern was expressed among clinicians regarding the burden of time-consuming administrative tasks that contribute to substantial inefficiencies. Moreover, the increase in administrative tasks was believed to negatively affect physician satisfaction through work-life balance. From this meeting, Division leadership developed eight strategic priorities, one of which was to reduce physician burden in relation to administrative tasks associated with the internal (InBox) messaging system.

Through this intervention, the Division of General Internal Medicine hoped to learn more about the clinician relationship with the InBox messaging system with the primary objective to decrease the amount of time clinicians spend on administrative tasks and to increase their efficiency. The secondary objective was to decrease clinician administrative task workload by reassigning specific administrative tasks to allied health staff (clinical assistants [medical assistants], medical secretaries, and appointment coordinators) to facilitate performance at their highest capacity and competency levels (see Sidebar: New administrative tasks assigned to allied health staff).

Methods

This project was conducted at Mayo Clinic in Rochester, MN, in the Division of General Internal Medicine and was prompted by clinicians' responses to the 2009 Annual Staff Satisfaction Survey. A survey was developed using Sirota Survey Intelligence software and consisted of 65 questions. Of these questions, 58 were asked on a 5-point Likert scale ranging from very favorable to very unfavorable, and the remaining 7 questions inquired

New administrative tasks assigned to allied health staff

- Sort and organize outside medical records
- Call patients with normal results
- Initiate billing process
- Enter orders
- Gather history information such as health maintenance, past medical history, family history, and chief complaint

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about respondent characteristics (age, sex, work schedule, etc); there also was a blank comment box. An additional 15 questions (for the Department of Nursing responses) and an additional 11 questions (for clinician response) were asked on a 5-point Likert scale. A total of 79 clinicians received the survey, and 58 (73.42%) responded.

To prioritize the most burdensome and time-consuming clinician tasks, 62 of 79 (78%) clinicians participated in a Division of General Internal Medicine clinician survey consisting of 6 questions to assess the implementation of process changes by allied health staff. The last question required clinicians to rank 12 identified "inefficient" administrative tasks by level of importance (ie, which tasks should be addressed first) using a 12-point Likert scale (1 = most important; 12 = least important), as shown in Figure 1. A Pareto diagram was developed from the results of the ranked tasks and was used to identify

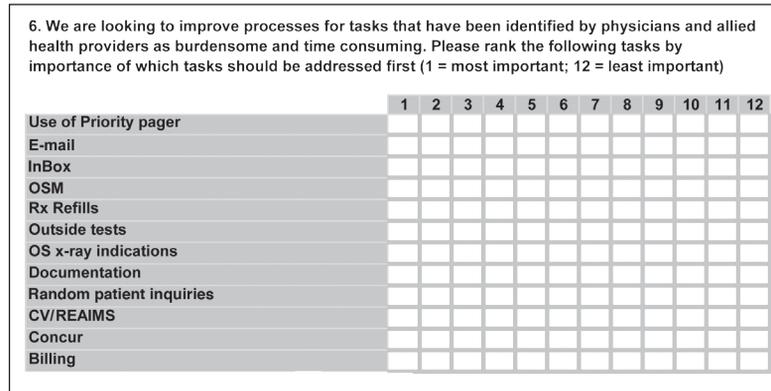


Figure 1. Clinician tool rank importance of inefficient tasks.

CV/REAIMS = curriculum vitae/Research and Education Academic Information Management Systems; OS = outside; OSM = outside material; Rx = prescription.

and to outline dissatisfiers voted on by clinicians (Figure 2).

The clinician relationship with the InBox messaging system was further quantified and analyzed using surveys, value stream mapping, and root cause analyses. The

Division of General Internal Medicine clinician survey was developed on the basis of the results of the root cause analysis, by a multidisciplinary team of 12 individuals who had varying responsibilities with InBox messaging. The survey consisted of

Table 1. Message standardization used in InBox by Mayo Clinic Division of General Internal Medicine (Outpatient)		
Message/notification type	Institution description	New general internal medicine description
Appointment	Appointment and/or scheduling questions/messages; getting information for prescheduling tests/consults	Appointment and/or scheduling questions/messages; getting information for prescheduling tests/consults
Care Review	Patient tests/consults need review by clinician and/or nurse communication about care	<i>Workflow Process Change</i> Clinical assistants (CA) verify InBox message first to assure item is complete before forwarding to physician Review of tests/results/consults; mail-in specimens; request to do test-oriented miscellaneous notes CAs to use secretaries for episode closure
Miscellaneous	Other patient-related messaging	Episode/Chart completion (eg, sign note, diagnosis, medication list)
Protocol/triage	Messages relating to specific protocols or triage processes	Used only for development appointments (ARF forms)
Prescription refill	Messages asking for prescription refills; requires physician review	Prescription or prescription refill requests
Telephone	Patient has contacted department with information or questions	a. Someone must call the patient back b. For patient "FYI" calls, list "FYI only" in subject line (no reply necessary)
Outside	Outside materials or laboratory results have been received and reviewed by clinician is requested	Outside material or laboratory results have been received on patients who have been seen at Mayo Clinic
Document inquiry	Sent by finance coders for clarification of a diagnosis or procedure that has not been clearly documented	a. Coding/billing issues b. Resident review of dictated letters and clinical notes c. Request to dictate or complete clinical note
Therapy certification	Therapy plan of care certification or recertification for authentication	Certification/form completion (internal or external)
Supervisory review	No description listed	a. Review of resident clinical notes b. NP/PA supervisory review

ARF = appointment request form ; FYI = for your information; NP = nurse practitioner; PA = physician assistant.

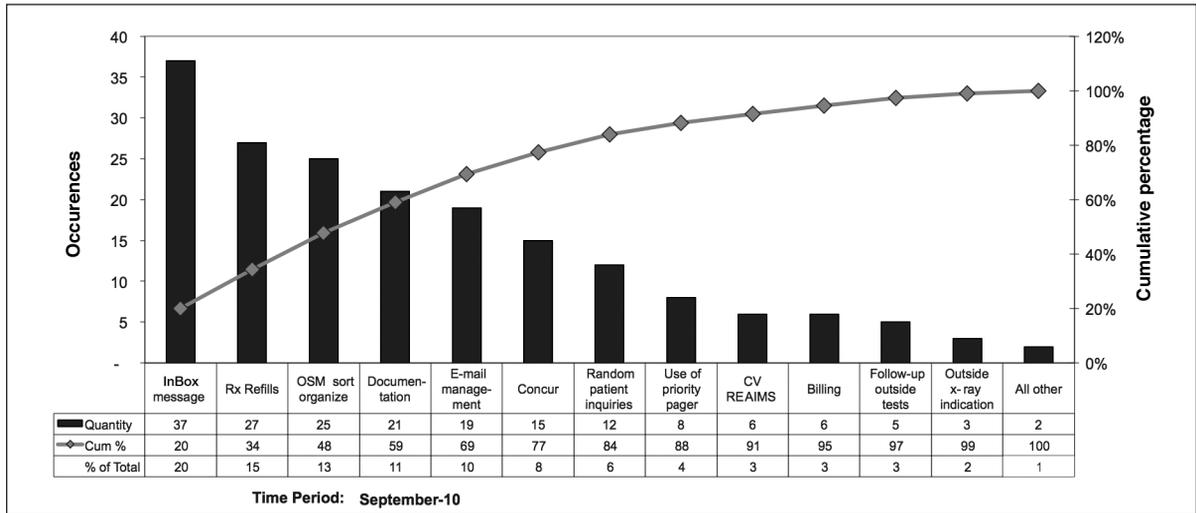


Figure 2. Pareto diagram of highest-rated clinician dissatisfiers, Mayo Clinic Division of General Internal Medicine.

Cum = cumulative; CV/REAIMS = curriculum vitae/Research and Education Academic Information Management Systems; OSM = outside material; Rx = prescription.

5 questions, and the questions were asked on a 5-point Likert scale ranging from very effective to very ineffective. A total of 28 clinicians received the survey, and 16 (57%) completed the survey.

We standardized the current institutional InBox messaging system, an internal, electronic program used at Mayo Clinic Rochester to facilitate the sending, receiving, and answering of patient-specific messages and alerts (Table 1). The implementation of the institutional InBox system in the EMR is a Mayo Clinic Foundation-based initiative, which is used in all departments throughout Mayo Clinic Rochester. We modified the institutional InBox interface to include clearly defined message categories in order to reduce ambiguity of the definitions within the message categories and to streamline user understanding and

implementation (Table 1). Clinicians and allied health staff received education and training on the use of the new, standardized InBox.

Twenty-eight clinicians participated in 2 separate pilot tests of the standardized InBox messaging system, each lasting 8 business days. The first pilot test (preintervention) was implemented in March 2011 and collected baseline data on the current state of understanding and usability of the InBox messaging system. Clinicians and allied health staff were educated and trained on appropriate timing and message flow processes, standardized category (message) types (Table 1), use of standard message content and format, and awareness of message volumes. After education and training, 28 clinicians completed the second pilot test (intervention

phase) in July 2011. Data obtained during the July 2011 intervention was compared with baseline survey results from March 2011. Defects (eg, incorrect use of message type in InBox) were tracked during each pilot test (Table 2).

After the pilot tests and analyses, results were presented to the leadership of the Division of General Internal Medicine. Templates were created for staff training using standard wording and format to facilitate continuity of terms and clarity of content. Multidisciplinary teams (clinicians and allied health staff) participated in three 45-minute education and training sessions over a 3-week period. Allied health staff were trained on appropriate processes, including timing of message flow, use of standard message content and format, standardized category (message) types, awareness of message volumes, and message prioritization. Allied health staff also acquired administrative tasks (previously completed by clinicians), including verification of completion of tests and consultations before review by clinicians. This transfer of tasks served to relieve clinicians of burdensome administrative tasks.

Results

The 2009 Mayo Clinic staff satisfaction surveys contained questions specifically for clinicians (total clinicians surveyed = 79; total clinician responses = 58 on 1 question, 57 on another). Responses

Defect	No. of defects		Error reduction	Percentage improvement
	Pilot 1	Pilot 2 ^a		
Test/consults not complete	5	3	2	40
Message unnecessary	6	2	4	66.67
Incorrect message type	8	1	7	87.5
Duplicate message	3	0	3	100
Inaccurate priority listing	3	0	3	100
Message unclear	3	0	3	100
Sent to incorrect individual	9	1	8	88.89
Total	37	7	30	83.29 ^b

^a Pilot 2 came after staff education and training.

^b Average.

revealed a poor work-life balance (41% favorable response), which respondents attributed to their increased administrative tasks (25% favorable response), as displayed in Table 3.

InBox messaging was rated the number 1 most time-consuming and burdensome task in the Division of General Internal Medicine clinician satisfaction survey (Figure 2). Clinicians received, on average, 1157 InBox messages over 8 business days (Table 4).

The number of defects entered into InBox was reduced from 37 in the first pilot test to 7 in the second pilot test (Table 2). The percentage of frequent InBox defects decreased from 25% to 10% (Table 4). Because of the intervention of the standardized InBox, improvement of all 6 tracked defects was identified from Pilot 1 to Pilot 2. Incorrect message type improved by 87.5%, inaccurate priority listing improved by 100%, and messages sent to the incorrect individual improved by 89% (Table 2). In addition, 53% of clinicians believed that the standardized InBox positively affected their work, and a postimplementation survey revealed that 100% of clinicians reported no negative impact on their work (data not shown). No major problems were encountered during or after the process changes.

Discussion

The implementation of the standardized InBox messaging system substantially reduced the number of administrative tasks performed by cli-

nicians by training allied health staff on new processes and by decreasing administrative tasks previously completed by clinicians. This was evaluated through postimplementation observation. Therefore, clinician time spent on administrative tasks decreased, suggesting increased clinician efficiency and improved satisfaction with work-life balance. Although clinician efficiency and satisfaction with work-life balance was not measured, previous research has shown that physicians who spend less time on administrative work are more satisfied.⁴ Consistent education and training on the management of InBox tasks and prioritizations such as message-type definitions (Table 1), content, and format created a uniform understanding for both clinicians and allied health staff. Emphasis placed on communication expectations was critical to the overall success of the standardized InBox.

The implementation helped create an efficient, cohesive care team, and since its implementation in the Division of General Internal Medicine, other sections within the Division are implementing these process changes. Furthermore, the Department of Medicine has recommended that other divisions implement the new, standardized InBox and training processes. Clinicians who participated in the prototyping of this project provided feedback that stated that they were more satisfied because of the reduction in administrative tasks performed, increased

calendar management and flexibility, and a more efficient care team model.

Several factors serve as limitations to our project. First, the results of our analysis represent the findings of a single institution and generalizing these results to other institutions may not be possible. Second, our electronic communication system, InBox, is an authentic, internal Mayo Clinic communication tool. Reproduction of this project may not be possible or may require modification because of different electronic communication tools at other institutions.

Third, during the development of the standardized InBox, we were limited with the amount of “message type” categories we could implement; thus, message type could not be changed after it was sent, and messages could be sent to only one person at a time. Last, these data represent preliminary findings. However, they are representative of the issues faced during daily practice, and thus the InBox process improvement changes were implemented immediately to enhance quality and reduce incorrect messaging rework.

Conclusion

This project demonstrated the successful implementation of the standardized InBox messaging system in the Division

53% of clinicians believed that the standardized InBox positively affected their work, and a postimplementation survey revealed that 100% of clinicians reported no negative impact on their work ...

Question	Total no. of clinicians surveyed	Total no. of clinician responses	Response, %		
			Very favorable/favorable	Neutral	Very unfavorable/unfavorable
The amount of time I spend on clerical tasks is reasonable	79	57	25	14	61
I am satisfied with the balance between my work life and my personal life	79	58	41	19	40

Survey (month)	Response rate, no. (%)	No. of messages received	Rate of InBox defects, % ^a		
			Frequently	Occasionally	Never
Baseline (March 2011)	28 (57)	1118	25	67	6
Postpilot (July 2011)	28 (61)	1195	10	84	6

^a Includes duplicate messages, inaccurate message notification type, inaccurate message timing, and unclear message content.

of General Internal Medicine, resulting in a reduction of the number of administrative tasks completed by clinicians. The findings of this project suggest increased clinician and allied health efficiency, satisfaction, improved clinician work-life balance, and decreased clinician burden because of the need to complete fewer administrative tasks. In the fall of 2012, the Division of General Internal Medicine participated in a strategic retreat to assess the outcomes and impact of our intervention. Further work is needed to determine its feasibility in other institutions and its long-term outcomes. Future investigation would include measures of staff satisfaction, work-life balance, and efficiency. Further research endeavors will capture a larger data set and will investigate the long-term outcomes and feasibility of implementation in other institutions. ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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A Good Impression

A full beard is an efficient badge of the doctor's calling,
and is essential in establishing his professional identity among the people
A physician should never dress flashily, but he should be garbed well.
It creates a good impression.

— Albert V Harmon, MD. *Large fees and how to get them*. Chicago: WJ Jackman; 1911